

Dynamics of Information Packaging in Korean

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ABSTRACT

This paper discusses deletion and movement operations in Korean from the perspective of information packaging, and claims that each operation is a systematic process of information packaging to generate the most optimized information structure. This paper argues that there is neither free word order nor free deletion in Korean. This paper explicitly illustrates that old arguments cannot stand still in information structure, but must undergo some kind of structural changes or deletion. This paper proposes a constraint on information packaging that covers both operations and gives an explanation of underlying motivation for them. It is also suggested to decompose each component of information structure into a feature complex.

1. Introduction

It is generally known that Korean is a highly context-dependent language, and said that any arguments recoverable from the context are freely dropped. This paper starts from a doubt on the second assumption, and attempts to characterize the deletion of arguments in Korean as a systematic process motivated and restricted by information packaging strategy in the sense of Vallduvi(1992) and Vallduvi & Engdahl(1996). The following examples illustrate diverse deletion of arguments in Korean:

- (1) A: nuku-ka Minsu-eykey chaek-ul tenchi-ess-ni?
who-nom Minsu-dat book-acc throw-pst-qus
'Who threw a book to Minsu?'
- B1: Suni-ka Ø Ø tenchi-ess-e.
Suni-nom throw-pst-dcl
'Suni threw it.'
- B2: Minsu-eykey-nun_i Suni-ka t_i Ø tenchi-ess-e.
Minsu-dat-top Suni-nom throw-pst-dcl.
'As for Minsu, Suni threw it to him.'
- B3: chaek-un_i Suni-ka Ø t_i tenchi-ess-e.
book-top Suni-nom throw-pst-dcl.
'As for a book, Suni threw it.'
- B4: # Suni-ka Minsu-eykey chaek-ul tenchi-ess-e.
Suni-nom Minsu-dat book-acc throw-pst-dcl.
'Suni threw a book to Minsu.'

The responses in (1B1)-(1B3) are felicitous, and this gives the superficial impression that deletion of old arguments is optional.¹ Close observation, however, makes us notice several important points. First, the answers in (1B1)-(1B3) denote slightly different interpretations, though they express the same propositional content. Secondly, the undeleted old arguments in (1B2) and (1B3) undergo some kind of structural changes. That is, *Minsu* in (1B2) and *chaek* 'book' in (1B3) are moved from their canonical position to the sentence initial position, and the topic marker *nun* is attached to them. Thirdly, the sentence (1B4) shows that the repetition of an old argument without any structural difference makes the answer unnatural. The examples in (1) imply that dynamic changes (including deletion) of old arguments are obligatory in Korean, and that these changes are closely related with some kind of functional structure which induces the different interpretations.

The object of this paper is twofold. One is to show that deletion as well as movement of old arguments is a systematic process of information packaging to generate the most optimized information structure. This paper argues that there is neither free word order nor free deletion in Korean from the viewpoint of information packaging. The other is to suggest a constraint on information packaging which covers both deletion and movement operations. The constraint gives an indirect account for the motivation of both processes. This paper examines diverse information structures in question-answer dialogue from the perspective of information packaging and shows that old arguments always undergo deletion or some kinds of structural change to denote their functional change in information structure.

2. The realization of information packaging in Korean

Information packaging is a structuring of sentences by syntactic, morphological, or prosodic means, or a combination of these with a purpose to optimize the delivering of new information to the hearer. Information structure consists of focus and ground, while the latter is further subdivided into link and tail:

- (2) S = {focus, ground}
 ground = {link, tail}

The ground-focus partition reflects the given-new partition. The focus provides new information. It constitutes the only informative part of a sentence and cannot be omitted. The ground contains known information that the hearer already possesses via dialogue context or previous situation. Though it doesn't deliver informative new information, it indicates where and how the hearer should store the new information. A link carries the sentence-initial topic-like expression and directs the hearer to go to a given address and retrieve the new information by adding under the given address. A tail indicates how the focus fits under a particular address. Information packaging is affected by the context because it depends on the speaker's assumptions about the hearer's knowledge and attentional state.

The realization of ground in Korean is associated with the left-hand movement. The ground phrases move to the left of focal ones, while the focal phrases appear in their canonical position:

- (3) a. [_F nuku-ka chaek-ul tenchi-ess-ni?]
 who-nom book-acc throw-pst-qus
 'Who threw a book?'

¹ I use the term, 'old arguments', to denote the arguments appeared in the previous context. The old argument is distinguished from old information in that the former may function either as old information or as new information according to the speaker's assumption about the hearer's attentional state.

- b. [_L chaek-un_i] [_F nuku-ka t_i tenchi-ess-ni?]
 book-top who-nom throw-pst-qus.
 'As for the book, who threw it?'
- c. [_T chaek-ul_i] [_{CF} **Nuku-ka** t_i tenchi-ess-ni?]
 book-acc **who-nom** throw-pst-qus.²
 'Who was it that threw the book?'

(3a) has all-focus instruction lacking a ground. (3b) and (3c) have grounds formed by the moved *chaek-un* 'book-top' and *chaek-ul* 'book-acc' and denote link-focus and tail-contrastive focus instruction, respectively. All the questions have the same propositional content but different information structure. These kinds of different information packaging are viewed in Vallduvi 1992 as different instructions for information update. They encode different instruction types, i.e., different ways of indicating how the meaning of the sentence should be unpacked. *Chaek-un* 'book-top' in (3b) and *chaek-ul* 'book-acc' in (3c) are same in that both constitute ground phrases, but different in that the former is a link, while the latter a tail. The link is associated with left-most movement and the topic-marker *nun* attachment. On the other hand, the tail is realized with a case marker and moved to the left of a contrastive link or a contrastive focus. Based on Kim(1999a), this paper assumes that Korean word order reflects information structure rather than syntactic structure, and it is realized in the order of link > tail > contrastive link > (contrastive) focus. The tail composes presupposition and makes the background for the contrastive or exhaustive meaning. For example, the tail, *chaek-ul* 'book-acc' in (3c) is moved to the left of the contrastive focus, *Nuku-ka* 'who', and constructs the presupposition, 'x threw the book' along with the verb *tenchi-ess-ta* 'threw'. This sentence bears the exhaustive meaning like 'Who was it that threw the book?'

In addition to the three primitives, link, tail and focus, this paper considers two derived categories, contrastive link and contrastive focus.³ The contrastiveness is characterized by prosodic accent in Korean. A contrastive focus is structurally realized with strong A-accent and a contrastive link with strong B-accent.⁴ An example of a contrastive link is in the followings:

- (4) A: [_F nuku-ka chaek-ul tenchi-ko, nuku-ka kongchaek-ul tenchi-ess-ni?]
 who-nom book-acc throw-pst-and, who-nom notebook-acc throw-pst-qus
 'Who threw a book, and who threw a notebook?'
- B: [_{CL} chaek-**un**_i] [_F Suni-ka t_i tenchi-ess-e.]
 book-**top** Suni-nom throw-pst-dcl.
 'As for a book (but not a notebook), Suni threw it.'

² F-labeled bracket ([_F]) is used to delimit the focus, and [_L], [_T], [_{CF}] and [_{CL}] represent a link, a tail, a contrastive focus and a contrastive link, respectively. The bold letter indicates the lexical item associated with strong prosodic accent.

³ Contrastive link and contrastive focus correspond to contrast and exhaustive focus in Kuno(1972).

Vallduvi & Vilkuna(1995) maintains that contrastive link and contrastive focus are in common in that both have presupposition and a set of alternatives for the contrasted elements, but their informational status are different. The former is a ground, while the latter a focus.

⁴ Jackendoff(1972) categorizes two kinds of intonation pattern of discorsal function of the expression dubbed with the particular intonation: A-accent and B-accent. A-accent is a pitch accent with a level high tone(H*) and B-accent is that with a low-high(LH*) tone. Focus accent contour is A-accent almost universally and contrastive link shows a prominent B-accent cross linguistically. This paper assumes that A-accent is assigned to the focus and the contrastive focus, while the difference between them is made by the strong tone of the accent. In other word, a focus has weak A-accent, whereas a contrastive focus strong A-accent. In the same line, a link has weak B-accent, and a contrastive link strong B-accent in Korean.

Chaek-un, 'book-top' in (4B) is dubbed with strong B-accent and this sentence has the contrastive meaning. In this case, the feeling of contrastiveness comes from the strong B-accent that identifies the link with *chaek* 'book' between the two candidates, *chaek* 'book' and *kongchaek* 'notebook'.

Summarizing, information structure is composed of several constituents such as link, tail, focus, contrastive link, and contrastive focus, and the manifestation of each constituent in Korean is as follows:

(5)

structural manifestation constituent of IS	movement	<i>nun</i> attachment	strong accent	
link	O	O	×	left-most movement
tail	O	×	×	movement to the left of contrastive link or contrastive focus
contrastive link	O	O	O	movement to the left of focus, <i>nun</i> attachment and B-accent
contrastive focus	×	×	O	A-accent
focus	×	×	×	

3. Dynamic changes of old arguments in Korean

3.1 Obligatory deletion vs. obligatory movement of old arguments

This section examines the cases of obligatory deletion and obligatory movement of old arguments in view of information packaging. As a first approximation, consider the old argument that functioned as a link in the previous context:

- (6) A: [_L Suni-nun_i] [_F t_i mues-ul tenchi-ess-ni?]
 Suni-top what-acc throw-pst-ques
 'As for Suni, what did she throw?'
- B1: # [_L Suni-nun_i] [_F t_i chaek-ul tenchi-ess-e.]
 Suni-top book-acc throw-pst-dcl.
 'As for Suni, she threw a book.'
- B2: [_L Ø_i] [_F chaek-ul t_i tenchi-ess-e.]
 book-acc throw-pst-dcl.
 'She threw a book.'
- B3: [_{CL} Suni-nun_i] [_F t_i chaek-ul tenchi-ess-e.]
 Suni-top book-acc throw-pst-dcl.
 'As for Suni (but not others), she threw a book.'

The question (6A) has link-focus instruction. With positing *Suni* in the link position, the speaker indicates that he is talking about *Suni* and instructs the hearer to go to the address *Suni* in his knowledge store and then retrieve the focus by adding under *Suni*. Comparing the answers (6B1) and (6B2), the latter is more natural than the former. The awkwardness of (6B1) comes from the repeated link, *Suni-nun*. It conveys redundant informational function in the sense that it repeats the instruction of the link to the hearer who already has *Suni* as a link in his mind. Without the

repetition, the hearer knows where the focus must be stored. Korean avoids this kind of redundancy in information structure, and deletion is adopted to reduce the redundancy.

One interesting thing we cannot pass over is that the former link, however, can be realized as a contrastive link in the following context as shown in (6B3). The structural difference between (6B1) and (6B3) is the strong tone of the prosodic accent; *Suni-nun* in (6B1) has weak B-accent, while that of (6B3) the strong one. The sentence (6B3) has contrastive link-focus instruction and it is a felicitous response provided that there is another candidate for the link known both to the speaker and to the hearer, and that the speaker assumes that it is necessary for the link to be contrasted with the other one. In such a case, the contrastive link *Suni-nun* cannot be deleted but must be moved and dubbed with strong B-accent to deliver the contrastive meaning.

In the same line, the following examples show what changes the former tail undergoes:

- (7) A: [_T *chaek-ul*]_i] [_{CF} **nuku-ka** t_i tenchi-ess-ni?]
 book-acc **who-nom** throw-pst-qus
 'Who was it that threw the book?'
 B1: #[_T *chaek-ul*]_i] [_{CF} **Suni-ka** t_i tenchi-ess-e.]
 book-acc **Suni-nom** throw-pst-dcl.
 'It was Suni that threw the book.'
 B2: [_T Ø_i] [_{CF} **Suni-ka** t_i tenchi-ess-e.]
Suni-nom throw-pst-dcl
 'It was Suni that threw the book.'
 B3: [_L *chaek-un*]_i] [_{CF} **Suni-ka** t_i tenchi-ess-e.]
 book-top **Suni-nom** throw-pst-dcl.
 'As for the book, it was Suni that threw it.'

(7A) has tail-contrastive focus instruction and means 'who is it that threw the book?' With the tail *chaek-ul* 'book-acc', this question implies that the speaker has a presupposition, 'x threw the book.' As to the question (7A), the answer (7B1) is unnatural because it contains the redundant tail *chaek-ul* 'book-acc', while the answer (7B2) lacking the repeated tail is felicitous. Without the repeated tail, the questioner can recover the contrastive meaning of the focus based on the presupposition he has already had and the strong A-accent dubbed to the contrastive focus, *Suni-ka*.⁵ The different acceptability between (7B1) and (7B2) presents that the redundant tail must be deleted.

In addition to (7B2), (7B3) is a possible answer to the question (7A). In (7B3), the old argument, *chaek* 'book' changes its informational function from a tail to a link, and it is not redundant in view of information packaging because it gives the hearer new instruction, which indicates the new address for the contrastive focus. This kind of answer is made when the speaker assumes that it is necessary to construct a new link for the contrastive focus. In this case, the old argument must be presented through movement and *nun* attachment. The above examples in (6) and (7) illustrate that the main factor inducing deletion in Korean is not the oldness of an argument, but the redundant informational function of the argument in information structure.

Finally, let's examine what changes happen to the former focus:

- (8) A: [_F *Suni-ka* mues-ul tenchi-ess-ni?]
 Suni-nom what-acc throw-pst-qus
 'What did Suni throw?'

⁵ In (7B2), the contrastive focus *Suni-ka* dubbed with strong A-accent has the exhaustive meaning, and indicates this sentence has presupposition. The questioner can recover the presupposition 'x threw the book.' based on (7A) made by himself.

- B1: # [_F Suni-ka chaek-ul tenchi-ess-e.]
 Suni-nom book-acc throw-pst-dcl.
 'Suni threw a book.'
- B2: [_F Ø chaek-ul tenchi-ess-e.]
 book-acc throw-pst-dcl
 'She threw a book.'
- B3: [_L Suni-nun_i] [_F t_i chaek-ul tenchi-ess-e.]
 Suni-top book-acc throw-pst-dcl.
 'As for Suni, she threw a book.'
- B4: [_T Suni-ka_i] [_{CF} t_i **chaek-ul** tenchi-ess-e.]
 Suni-nom **book-acc** throw-pst-dcl.
 'It was a book that Suni threw.'
- B5: [_L Suni-**nun**_i] [_F t_i chaek-ul tenchi-ess-e.]
 Suni-**top** book-acc throw-pst-dcl.
 'As for Suni (but not others), she threw a book.'

(8A) is an all-focus question lacking a ground. At the time of questioning, *Suni-ka* is a part of focus. It is repeated as a part of focus in (8B1) and deleted in (8B2), while it is changed to a link in (8B3), a tail in (8B4) and a contrastive link in (8B5). The answers (8B1) and (8B2) are same in that they have all-focus instruction but different in that the old argument *Suni* is repeated in (8B1) with the same informational function, a focus, while it is deleted in (8B2). The repeated focus in (8B1) can be analyzed as another case of redundant old argument parallel with the repeated link and tail. It makes the sentence unnatural. On the contrary, in (8B2), the old argument, *Suni*, is deleted without any informational function. This kind of simplified answer comes out when the speaker assumes that it is sufficient to give only new information to the hearer and that there is no need to instruct him where or how to store the new information.

The answers in (8B3) to (8B5) contain the old argument, *Suni* that is realized as a link, a tail, and a contrastive link, respectively. All the answers are felicitous but deliver different instruction. When the speaker wants to emphasize the exhaustiveness of the new information, but assumes that the hearer's attentional state is not ready to appreciate the exhaustive meaning, he realizes the old argument as a tail and makes the answer like (8B4). If he wants to denote contrastive link-focus instruction, he makes the answer like (8B5). The structural changes of *Suni-ka* in (8B3) - (8B5) are obligatory processes in order to represent the new informational function of old arguments.

One more example related with a former focus is shown in (9):

- (9) A: [_F Suni-ka chaek-ul tenchi-ess-ni?]
 Suni-nom book-acc throw-pst-qus
 'Did Suni throw a book?'
- B: ung. [_T Suni-ka_i] [_{CF} t_i **chaek-ul** tenchi-ess-e.]
 yes Suni-nom **book-acc** throw-pst-dcl.
 'Yes. It was a book that Suni threw.'

Chaek-ul in (9B) is realized as a contrastive focus with strong A-accent. The sentence (9B) shows that the former focus is realized as a contrastive focus, if the speaker wants to deliver the contrastive meaning.

Summarizing, all the structural changes of old arguments including deletion are a process of information packaging for effective delivery of information. Deletion is adopted to reduce the functional redundancy of old arguments in information structure, while movement, *nun* attachment and(or) accent dubbing are used to represent the new informational function which the old arguments gain. As a first approximation to the general explanation of both processes, we

can suggest the following constraint on information packaging in Korean:

(10) Constraint on information packaging (first version)

An old argument must be realized in the information structure if and only if it gets a new informational function.

This rule implies that deletion and movement of an old argument is not optional; it cannot be realized (thus must be deleted) if it gets no new informational function, while the old argument with new informational function must be realized. To manifest the new informational function, the old argument must undergo movement, *nun* attachment and(or) accent dubbing.

3.2 Impossible realization of old arguments

Though the constraint (10) explains when an old argument must be deleted, it is still unrestricted in that it cannot cover several impossible changes of old arguments shown in the followings:

(11) A: [_L chaek-un_i] [_F nuku-ka t_i tenchi-ess-ni?]
 book-top who-nom throw-pst-qus
 'As for the book, who threw it?'

B1: # [_F Suni-ka chaek-ul tenchi-ess-e.]
 Suni-nom book-acc throw-pst-dcl.
 'Suni threw the book.'

B2: # [_{CF} **Suni-ka** chaek-ul tenchi-ess-e.]
Suni-nom book-acc throw-pst-dcl.
 'The fact was that Suni threw the book.'

(12) A: [_T chaek-ul_i] [_{CF} **nuku-ka** t_i tenchi-ess-ni?]
 book-acc **who-nom** throw-pst-qus
 'Who was it that threw the book?'

B1: # [_F Suni-ka chaek-ul tenchi-ess-e.]
 Suni-nom book-acc throw-pst-dcl.
 'Suni threw the book.'

B2: # [_{CF} **Suni-ka** chaek-ul tenchi-ess-e.]
Suni-nom book-acc throw-pst-dcl.
 'The fact was that Suni threw the book.'

(13) A: [_L Suni-nun_i] [_F t_i mues-ul tenchi-ess-ni?]
 Suni-top what-acc throw-pst-qus
 'As for Suni, what did She throw?'

B: # [_T Suni-ka_i] [_{CF} t_i **chaek-ul** tenchi-ess-e.]
 Suni-nom **book-acc** throw-pst-dcl.
 'It was a book that Suni threw.'

(14) A: [_T chaek-ul_i] [_{CF} **nuku-ka** t_i tenchi-ess-ni?]
 book-acc **who-nom** throw-pst-qus
 'Who was it that threw a book?'

B: # [_{CL} chaek-un_i] [_{CF} **Suni-ka** t_i tenchi-ess-e.]
 book-top **Suni-nom** throw-pst-dcl.
 'As for a book(but not others), it was Suni that threw it.'

The above examples illustrate three impossible changes of an old argument. First, (11) and (12)

show that the former ground(a link and a tail) cannot be realized as a focus or a contrastive focus in the following context. This kind of change is impossible in English, too. The small caps indicate the lexical item associated with sentential nuclear stress within the focus:

(15) A: What about John? What did he drink?

B1: #[_F JOHN drank beer]

B2: [_G [_L John] drank]] [_F BEER]

(16) A: What was it that John drank?

B1: #[_F JOHN drank beer]

B2: [_G John drank] [_F BEER]

Though it is not further testified in other languages, it would be a universal tendency that old information cannot be provided as new information.

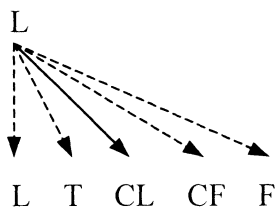
Secondly, (13) shows that the former link cannot be realized as a tail. In this case, the speaker of (13B) cancels the link of the hearer without giving any new link, and this makes it hard for the hearer figure out where to retrieve the new information.

Thirdly, (14) shows that the former tail cannot be realized as a contrastive link. This double accented sentence is unacceptable in Korean. Tentatively, we explain that both a link and a focus cannot be contrasted at the same time.

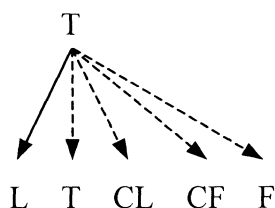
The diverse functional changes of old arguments in Korean are summarized as follows. The solid line denotes obligatory realization and dotted line obligatory deletion or impossible realization:

(17)

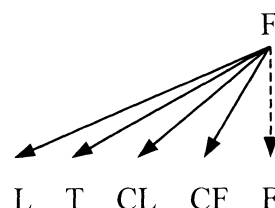
a.



b.



c.



3.3 Informational features

We have observed three kinds of options on old arguments; obligatory deletion, obligatory realization and impossible realization. To cover all these, this paper suggests to decompose each component of information structure into a feature complex. The informational features will be [\pm ground], [\pm link] and [\pm contrast], and each informational component will have the following feature complex:

(18)

constituents of IS Informational feature	link	tail	contrastive link	contrastive focus	focus
	[\pm ground]	+	+	+	-
[\pm link]	+	-	+	-	-
[\pm contrast]	-	-	+	+	-

The feature [\pm ground] distinguishes old information from new one. The element with [+ ground] is old information which is assumed to be known both to the speaker and to the hearer. It differentiates a (contrastive) link and a tail from a (contrastive) focus. The feature [\pm link] refers to the linkhood of old information, distinguishing a link from a tail. It also distinguishes a contrastive link from a contrastive focus. The feature [\pm contrast] refers to the contrastiveness of a link and a focus. This feature differentiates a contrastive link from a link, and a contrastive focus from a focus. Each feature is related with specific structural manifestation in Korean. For example, [+ground] is related with syntactic movement, [+link] with morphological *nun* attachment, and [+contrast] with prosodic strong accent.

Based on the above feature matrix, the constraint (10) is revised as follows:

(19) Constraint on information packaging (revised)

- a. An old argument must be realized in the information structure if and only if it gets (a) new positive informational feature(s).
- b. An old argument in Korean cannot lose (an) already established positive informational features(s).

The predicted realization of old arguments via (18) and (19) and their real realizations are compared in the followings:

(20)

change of informational function		change of informational feature	predicted realization	real realization	example
question	answer				
link	link	no	#	#	(6B1)
	tail	+l → -l	#	#	(13B)
	contrastive link	-c → +c	✓	✓	(6B3)
	contrastive focus	+g → -g +l → -l -c → +c	#	#	(11B2)
	focus	+g → -g +l → -l	#	#	(11B1)
tail	link	-l → +l	✓	✓	(7B3)
	tail	no	#	#	(7B1)
	contrastive link	-l → +l -c → +c	✓	#	? (14B)
	contrastive focus	+g → -g +l → -l -c → +c	#	#	(12B2)
	focus	+g → -g	#	#	(12B1)
focus	link	-g → +g -l → +l	✓	✓	(8B3)
	tail	-g → +g	✓	✓	(8B4)
	contrastive link	-g → +g -l → +l -c → +c	✓	✓	(8B5)
	contrastive focus	-c → +c	✓	✓	(9B)
	focus	no	#	#	(8B1)

The only exception to the constraint (19) is the change from a tail to a contrastive link shown in (14B). The answer is infelicitous even though the contrastive link, *chaek-un* 'book-top' gains [+link] and [+contrast] without losing [+ground]. I think that the unacceptability of (14B) does not come from the violation of the constraint (19). Consider the following examples:

- (21) A: [_L Suni-nun_i] [_{CF} t_i **mues-ul** tenchi-ess-ni?]
 Suni-top **what-acc** throw-pst-qus
 'As for Suni, what was it that She threw?'
 B: #[_{CL} Suni-**nun**_i] [_{CF} t_i **chaek-ul** tenchi-ess-e.
 Suni-**top** **book-acc** throw-pst-dcl
 'As for Suni(but not others), it was a book that She threw.'

(21B) is also infelicitous as (14B), though the change from a link to a contrastive link is possible as shown in (6B3). The unacceptability of both (14B) and (21B) must be explained from another view. I think that they are unacceptable not because they violate the constraint (19), but because they contain a contrastive link and a contrastive focus at the same time. This kind of double contrast makes the sentences infelicitous.

4. Conclusion

This paper examines deletion and movement processes in terms of information packaging. It is shown that the structural changes of old arguments are restricted by the former informational function of the arguments, and that the underlying motivation for deletion is not the oldness of arguments but the functional redundancy of the arguments in information structure. This paper suggests to decompose each component of information structure into a feature complex composed of distinctive features, [\pm ground], [\pm link] and [\pm contrast]. Using the feature complex, this paper suggests a constraint on information packaging, which covers obligatory deletion, obligatory realization, and impossible realization of old arguments. This paper maintains that there is neither free word order nor free drop of old arguments in Korean.

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